

Claims

We claim:

- 1 1. A polynucleotide molecule that comprises a nucleotide sequence encoding an
2 active toxin and a nucleotide sequence encoding a phage vector protein.
- 1 2. A nucleotide molecule of claim 1 wherein said toxin is derived from *Bacillus*
2 *thuringiensis*.
- 1 3. The polynucleotide molecule of claim 1 wherein said phage vector protein is
2 derived from a filamentous phage vector.
- 1 4. The polynucleotide molecule of claim 1 wherein said nucleotide sequence
2 encoding an active toxin and said nucleotide sequence encoding a phage vector protein are
3 expressed as a fusion protein such that a phage is formed having said active toxin displayed
4 on the surface thereof.
- 1 5. The polynucleotide molecule of claim 1 that encodes a fusion protein as shown
2 in Figure 1.
- 1 6. A polypeptide molecule comprising a phage region and a toxin region wherein
2 said polypeptide molecule is arranged to form a phage having said toxin region displayed on
3 the surface thereof.
- 1 7. The polypeptide molecule of claim 6 wherein said toxin region is derived from
2 *Bacillus thuringiensis*.
- 1 8. The polypeptide of claim 6 having an amino acid sequence as shown in Figure 1.

1 9. A method of preparing active *Bacillus thuringiensis* toxins comprising
2 transforming one or more cells with a polynucleotide molecule that comprises a nucleotide
3 sequence which encodes for an active *Bacillus thuringiensis* toxin and a nucleotide sequence
4 which encodes for a phage vector protein; and
5 growing said one or more cells under conditions such that said polynucleotide
6 molecule is expressed, thereby forming a fusion protein having toxic activity.

1 10. The method of claim 9 wherein said phage vector protein is derived from a
2 filamentous phage vector.

1 11. The method of claim 9 wherein said polynucleotide molecule encodes a fusion
2 protein having an amino acid sequence as shown in Figure 1.

1 12. The method of claim 9 wherein said one or more cells are prokaryotes.

1 13. The method of claim 13 wherein said one or more cells are of a type selected
2 from the group consisting of *E. coli* strain JM109, *E. coli* strain JM101, *E. coli* K12 strain
3 294, *E. coli* strain W 3110, *E. coli* X1776, *E. coli* XL-1Blue and *E. coli* B.

1 14. The method of claim 13 wherein said one or more cells are *E. coli* strain JM109.

1 15. A method of screening for novel *Bt* toxins comprising obtaining a phage display
2 library comprising a plurality of recombinant phage having a toxin displayed on the surface
3 thereof; and

4 screening said library to identify a phage clone comprising phage which bind to a
5 toxin specific target.

1 17. A phage clone comprising phage that comprise a polynucleotide molecule having
2 a nucleotide sequence that encodes a toxin, wherein said phage have said toxin displayed on
3 the surface thereof.

1 18. An isolated polynucleotide molecule produced by the method of claim 16..

1 19. One or more plant cells transformed with a polynucleotide molecule produced:
2 by the method of claim 16.